

# LANL experimental plan for $^{35}\text{Cl}(n,p)$ reaction

**H.Y. Lee and S. Kuvin**

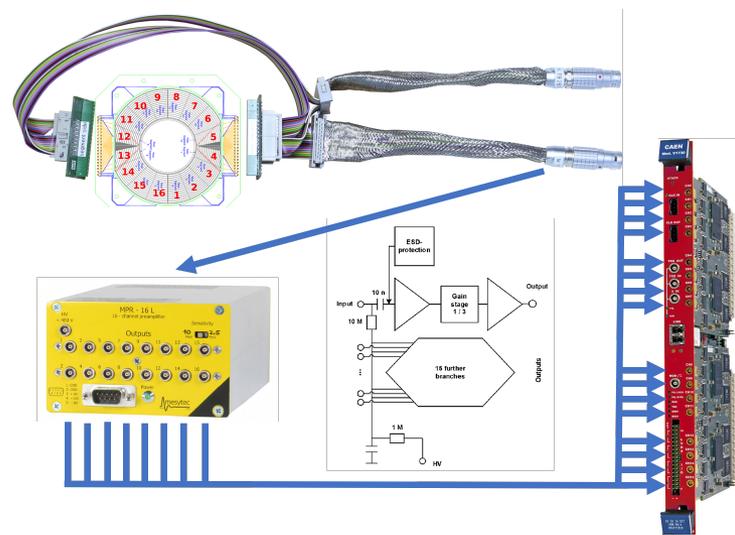
**Physics Division, LANL**

*US NDP Nuclear Data Week: NDAC annual meeting  
Nov. 7 2019*

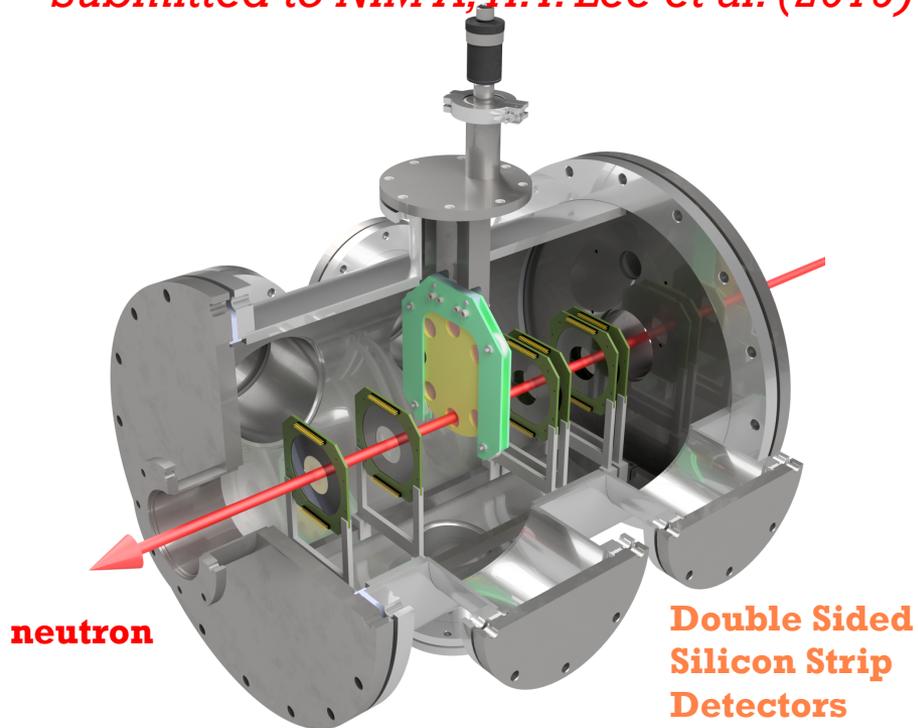
# Low Energy (n,z) (LENZ): Direct measurement of double differential cross sections

- Designed for measuring (n,z) reactions simultaneously with a large detection coverage and a low detection threshold for various applications, using solid targets & digitizers

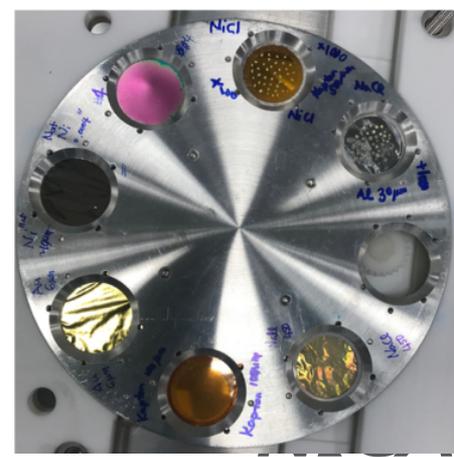
- Summary of the LENZ development with a focus on the Pulse Shape Discrimination for silicon detectors, Submitted to NIM A, H.Y. Lee et al. (2019)*



Post processing of digitized waveforms enables high selectivity for signals and high-quality data based on redundant information and preserving raw data

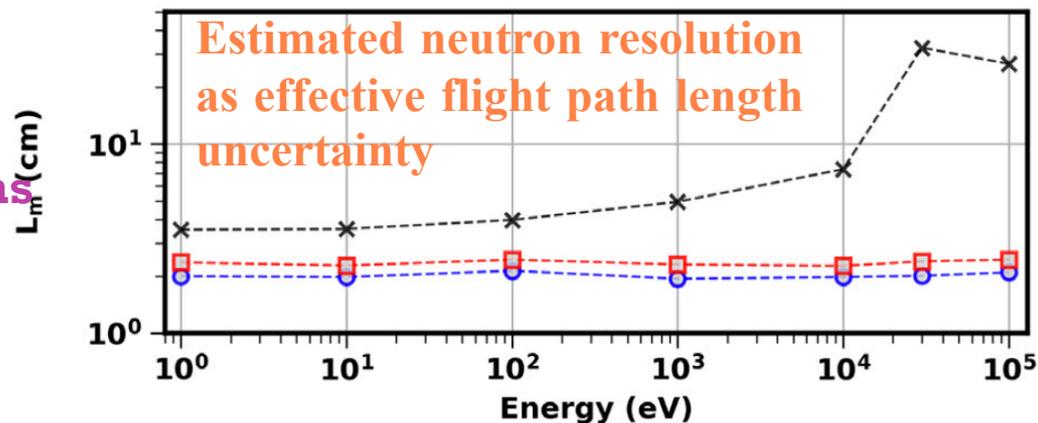
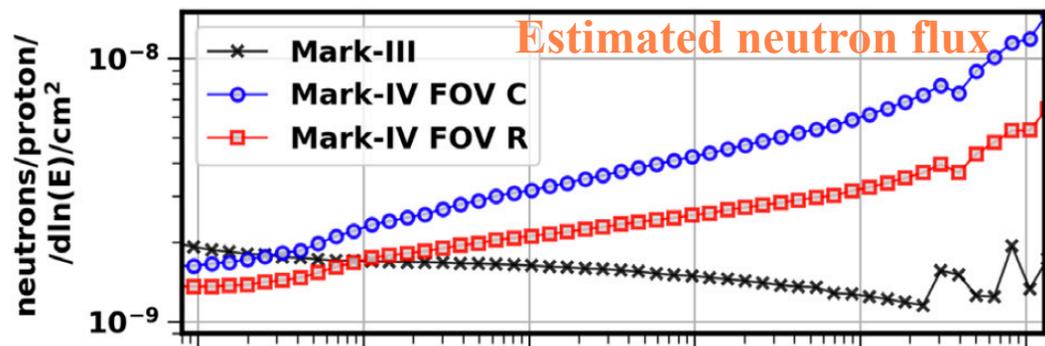
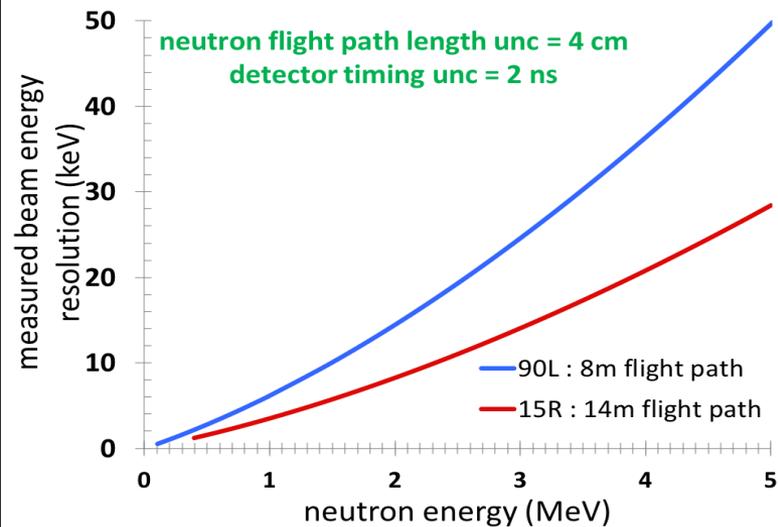


Instead of gas targets, we developed solid & thin-film target fabrications for reducing systematic uncertainty



# $^{35}\text{Cl}(n,p)$ cross section measurements using LENZ

At Lujan after the Mark-IV upgrade  
(thermal – 1 MeV)



At WNR (0.5 – 20 MeV) energy  
resolutions for 90L & 15R flight paths

Mark-III: current Mark-III Flight path 14 performance (black crosses)

Mark-IV FOV C: new Mark-IV data for Field of View (FOV) center, when the flight path is aligned to the center of the disk Mark-IV target

Mark-IV FOV R: FOV Real, when the flight path is aligned to the former Mark-III backscattering water moderator.

# Timeline for LANL measurements

Year	FY21				FY22			
Quarters	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
LASNCE beam cycle	→			→	→			→
WNR measurement	→			→	→			
Lujan measurement				→	→			→
LENZ analysis	→							

○ Lujan Mark IV target upgrade is scheduled to be FY21 Q3